

REMARKS

Claims 1-29 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1, 2, 5, 6, 9, 11, 12, 15, 16, 19, 21 and 23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Qian (U.S. Pat. No. 6,512,352). This rejection is respectfully traversed.

With respect to Claim 1, Qian fails to show, teach or suggest a coupled inductor having first and second windings, wherein the first winding and the second winding having a coefficient of coupling approximately equal to one.

The Examiner has failed to support a prima facie case under 35 U.S.C. §102 and/or 35 U.S.C. §102 with an inherency argument. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil co. of California, USPQ2d 1051, 1053 (Fed. Cir. 1987). The Examiner admits that the Qian reference is completely silent as to the coefficient of coupling of the windings. Therefore, the rejection of Claim 1 under 35 USC §102(b) (without an inherency argument) is improper and must be withdrawn.

The Examiner argues that Qian shows all of the elements of Claim 1 but tacitly admits that **Qian is silent with respect** to the requirement that the coupling coefficient of the coupled inductors is approximately equal to one. To support the current rejection,

the Examiner must argue that having a coefficient of coupling of approximately one in a coupled inductor is inherently taught by Qian. In support thereof, the Examiner refers to the Stratton reference (U.S. Pat. No. 4,273,051).

The fact that a certain characteristic **may occur or be present** in the prior art reference is not sufficient to establish inherency of that characteristic. *In re Rijckaert*, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (emphasis added). The Federal Circuit has clearly stated that:

To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is **necessarily** present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities.'

In re Robertson, 49 USPPQ2d 1949, 1950-1951 (Fed. Cir. 1999) (emphasis added).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic **necessarily** flows from the teachings of the applied prior art." *Ex Parte Levy*, 17 USPQ2d 1461 (Bd. Pat. App. & Inter. 1990) (emphasis original). Therefore, the coupling coefficient of approximately one must **necessarily flow** from the teachings of the Qian reference. **Applicant respectfully asserts that this is not the case here.**

Even if some prior art transformers may commonly have a coefficient of coupling of 0.998, this fact is not dispositive here. Transformers can also have other coefficients of coupling as demonstrated by other teachings in the relied upon Stratton reference. In particular, **Stratton expressly recommends coefficients of coupling K in the range of 0.5 to 0.9.** See Col. 5, lines 48-51.

Furthermore, Claim 1 recites a coupled inductor having first and second windings **that are connected in series** to form a common node such that the first winding and the second winding have the same polarity. The first and second windings of the Stratton reference show windings that are **not connected in series**. The windings in Stratton are wound around a common core but are not directly connected together.

Therefore, while the Examiner may have provided a secondary reference that discloses one transformer having a coupling coefficient of 0.998 (**as well as 0.5 to 0.9**), this does not necessarily mean that the coupling coefficient of the particular coupled inductor in Qian is **necessarily** the same as is required to support an inherency argument under 35 U.S.C. §102.

Therefore, Applicant respectfully asserts that the Examiner has failed to properly support his rejection under either 35 U.S.C. §102 and/or 35 U.S.C. §102 with an inherency argument.

Claim 1 is therefore allowable over the prior art of record. Claim 11 is allowable for at least similar reasons as Claim 1. The remaining Claims are either directly or indirectly dependent upon allowable Claims 1 and 11 and are therefore allowable for at least similar reasons.

REJECTION UNDER 35 U.S.C. § 103

Claims 3, 4, 13, 14 and 26-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Qian (U.S. Pat. No. 6,512,352).

With respect to Claim 3, Qian does not show, teach or suggest using a turns ratio $N1/N2$ that is set to a predetermined value of at least two.

The Examiner **incorrectly** states that “Applicant has not disclosed that a turns ratio of two solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any other turns ratio”. Applicant **expressly** described the particular purpose and advantages of the claimed turns ratio:

[0021] The coupled inductor 36a may have a first winding of N1 turns and a second winding of N2 turns. A turns ratio of N1/N2 may be set to a predetermined value to control the flow of energy through the coupled inductor 36a. For example, with a turns ratio of 0, a standard topology buck converter is formed. With a turns ratio of 2, the duty cycle of the voltage regulator is approximately two times greater than the duty cycle for the standard topology buck converter, the current flowing through the coupled inductor 36a is approximately one-half the amplitude, and the voltage impressed across the drain-source of the freewheeling switch 34a is less than the voltage impressed across the drain-source of the standard topology buck converter. The voltage impressed across the drain-source of the freewheeling switch 34a is approximately,

$$V_{ds} \cong (V_{in} - V_{out}) * \left(\frac{N2}{N1 + N2} \right) + V_{out} .$$

In contradistinction, in a standard

topology buck converter the voltage impressed across the drain-source of the freewheeling switch is approximately, $V_{ds} \cong V_{in}$.

[0022] Therefore, the freewheeling switch 34a may be selected to have a lower withstanding voltage, V_{ds} ; and by using a similar die size to what a standard topology switch would use, the $R_{ds(on)}$ for the freewheeling switch 34a may also be lower.

Applicant's specification at paragraphs [0021]-[0022]. Therefore, Applicant expressly set forth specific advantages when using the claimed turns ratio. For example, the freewheeling switch may be selected to have a lower withstanding voltage and the $R_{ds(on)}$ may be lower. None of these limitations are taught or suggested by the prior art references.

Therefore, Claim 3 is allowable for at least this reason. Claim 4 is dependent upon Claim 3 and is allowable for at least similar reasons. Claims 13 and 14 are allowable for at least similar reasons as Claims 3 and 4.

With respect to Claims 26-29, Qian also does not show, teach or suggest using a freewheeling switch that has a lower withstanding voltage than a conduction switch.

Switches that have a lower withstanding voltage typically have a lower $R_{ds(on)}$ or $V_{ce(sat)}$ than a switch with a comparable die size and a higher withstanding voltage. The lower $R_{ds(on)}$ or $V_{ce(sat)}$ may result in lower conduction losses. In addition, the switching losses may also be lower due to the lower voltage impressed across the freewheeling switch.

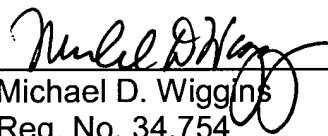
Therefore, Claims 26 and 27 are allowable for at least this reason. Claims 28 and 29 are allowable for at least similar reasons as Claims 26 and 27.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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